IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
- UTILITY PATENT APPLICATION -

BUOYANT WATERFOWL DECOY WITH INTERCHANGEABLE MOVABLE APPENDAGES

Field Of The Invention

The present invention generally relates to waterfowl decoy devices, and in its preferred embodiments more specifically relates to waterfowl decoy devices with positive buoyancy and interchangeable appendages to selectively provide propulsion, splashing action, and wing movement to simulate the appearance of live waterfowl.

Background Of The Invention

Waterfowl decoys have long been used by hunters in an effort to attract ducks and other waterfowl to a particular body of water or to a particular location in a body of water. Traditionally, such decoys have been made as inanimate structures that are placed on a body of water and allowed to float passively, without movement of any kind. Although stationary decoys generally simulate the appearance of waterfowl, the absence of movement severely limits their effectiveness in attracting waterfowl.

Attempts have been made in the past to overcome the problems associated with stationary decoys, and decoys that exhibit various forms of motion are known in the prior art. For example, U.S. Patent No. 2,799,960 to Riley discloses a decoy with a motor driven propeller and movable head. Other examples of propeller driven decoys include U.S. Patent No. 2,814,146 to Propp; U.S. Patent No. 2,835,064 to Webb; U.S. Patent No. 3,074,195 to Vanderpool; and U.S. Patent No. 3,000,128 to McAda. U.S. Patent No. 2.443,040 to Jones and U.S. Patent No. 2,704,416

to Laird disclose decoys with fully submerged paddle mechanisms to impart movement to a decoy. Other examples include U.S. Patent No. 2,747,314 to McGregor, which discloses a decoy apparatus with movable wings and head; U.S. Patent No. 2,480,390, which discloses a decoy with movable wings; U.S. Patent No. 4,896,448, which discloses a decoy with movable wings; and British Patent No. 383,031, which discloses a bird decoy with movable wings.

The efforts known in the prior art relating to floating decoys have been effective in producing one or more forms of motion, but have generally been much less effective in producing lifelike motion and imparting a realistic appearance to decoys, and in producing water movement around the decoys. Accordingly, they have been only marginally successful in providing the desired effect of attracting waterfowl. Many of the apparatus designs known in the prior art are complex in structure, adding to the cost of production and to the difficulty of use. Floating decoys with a body structure having a closed lower hull, that provide any form of movement or propulsion, may pose an additional problem. Such decoys typically include an access opening in the body of the decoy, and various openings for a drive shaft or the like, and do not prevent water from entering the body through those openings. During operation of the decoy, water accumulates in the body, causing the decoy to sink lower and lower in the water until the decoy finally sinks.

Some decoys, often utilizing rotating wings, are mounted on poles so that the decoy is elevated above the surface of a body of water or on land. Pole mounted decoys of the prior art are not adapted for use as floating decoys and are not suitable for that purpose. Conversely, floating decoys known in the prior art are not adapted for use as pole mounted decoys and are not suitable for that purpose.

Sub A2

There remains a need for decoy apparatus that produces movement to realistically simulate

the appearance of live waterfowl, that allows the same decoy body and drive mechanism to be used to produce a variety of movements, that will not sink during use, and that is useable as both a floating decoy and as a pole mounted decoy.

Summary Of The Invention

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The present invention provides a waterfowl decoy that addresses and overcomes the deficiencies and problems of the prior art by producing movement of appendages associated with the decoy that realistically simulates live waterfowl wing movement, propulsion, and splashing of the water around the decoy, and by providing a decoy with positive buoyancy to eliminate the problem of water ingress and sinking experienced with some prior art decoys. The movement exhibited by the decoy of the present invention is produced by a drive apparatus that is simple in structure and operation, inexpensive to produce, and easy to install in a decoy body. The optional simultaneous movement and splashing actions of the decoy are produced by the same drive apparatus. The decoy of the invention is designed to avoid retention of water in the body of the decoy and to maintain positive buoyancy. The decoy may be readily mounted on a vertical pole, so that the decoy may be used as a floating decoy or as a pole mounted decoy without alteration.

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The present invention utilizes a decoy body, generally comprising a body with a hollow interior, a top, two opposing sides, a head end, and a tail end. In the preferred embodiment a head and neck is rotatably mounted at the head end of the decoy so that the head and neck can be oriented in line with the longitudinal axis of the decoy or offset to either side of the axis. The decoy body is formed as a shell, with a fully open bottom provide access to the hollow interior for installation of the drive assembly and for operation of the drive assembly. A removable generally rigid buoyant base is disposed within the body shell at the lower edges thereof to loosely close the

majority of the bottom opening, leaving an opening into the interior between the rear of the base and the tail of the decoy. The base is sufficiently buoyant to support the entire decoy structure and prevent it from sinking, and the opening between the base and the tail allows any water entering the body to escape. The base includes a pole aperture extending fully through the base for the insertion of a pole when the decoy is to be used as a pole mounted decoy. The decoy body is also provided with a pair of shaft apertures formed in the opposing sides of the body through which drive shafts extend.

The drive assembly of the preferred embodiment of the present invention includes a pair of drive means, preferably battery powered electric motors, each of which drives a rotary shaft that extends through one of the shaft apertures in the sides of the body of the decoy and to which an appendage assembly is attached. In the preferred embodiment the output shaft of each motor comprises the drive shaft, and each motor is oriented in the hollow interior of the body with the drive shaft extending toward the adjacent side of the body and through the shaft aperture therein, so that the drive shafts are generally parallel to the surface of the water in which the decoy will float. The shaft apertures are positioned in the sides of the body, and the drive means are positioned in the hollow interior of the body, so that the drive shafts are disposed a distance above the surface of the water when the decoy is floating thereon. An appendage assembly is connected to each drive shaft on the exterior of the decoy body so that rotation of the drive shaft will cause rotation of the appendage assembly.

Although the use of two drive motors is preferred, a single motor may be used to drive the two drive shafts, either directly or through a transmission means. The use of dual drive motors is advantageous, especially when the paddle wheel assembly, described below, is used to propel

the decoy on the surface of a body of water. Unless the rotation of the paddles is synchronized and the positions of the paddles on each side of the decoy are aligned, paddles on opposite sides of the decoy will be drawn through the water at different times and the uneven application of propulsive force will cause the body of the decoy to "waggle" from side to side, further mimicking movements exhibited by live birds. Because the speed of rotation of the two motors will typically vary slightly, the degree of synchronization of the two paddle wheel assemblies will change during operation of the decoy, and the direction of movement by the decoy will vary over time, enhancing its mimicry of natural waterfowl behavior.

A variety of appendage assemblies may be interchangeably used within the scope of the present invention, and in the preferred embodiment at least a pair of paddle wheel assemblies and a pair of rotating wing assemblies are provided. Those assemblies may be used individually or both may be connected to a drive shaft to operate in unison. A windmill wing assembly may also be provided, for use with the decoy mounted on a pole. Each of these appendage assemblies includes a hub component adapted to be connected to a drive shaft of the drive assembly of the decoy, with paddle structures or wing structures, respectively, connected to the hub. With all but the windmill wing assembly, the decoy may be operated while floating on a body of water or may be mounted on a pole on land or above the surface of the water. Because of the range of movement of the wings of the windmill wing assembly and the need for clearance below the decoy, the windmill wing embodiment is operated with the decoy mounted on a pole. When the paddle wheel assembly is used, rotation of the paddles propels the decoy along the surface of the water and simultaneously splashes water toward the tail of the decoy. The direction of travel can be controlled by changing the orientation of the rotatable head and neck.

Sub A7 The structure and features of the preferred and various alternative embodiments of the invention are disclosed in detail with reference to the accompanying drawing figures.

Brief Description Of The Drawings

Figure 1 is a side view of a decoy of the preferred embodiment of the invention, with paddle wheel and rotating wing appendage assemblies.

Figure 2 is a side view of the decoy of the preferred embodiment of the invention, with rotating wing appendage assemblies, mounted on a pole.

Figure 3 is a top view of the decoy of the preferred embodiment of the invention, with rotating wing appendage assemblies, with the head and neck oriented for straight ahead movement.

Figure 4 is a top view of the decoy of the preferred embodiment of the invention, with combined paddle wheel and rotating wing appendage assemblies, with the head and neck oriented for curving movement to the right.

Figure 5 is a top view of a decoy of the preferred embodiment of the invention, with paddle wheel appendage assemblies, with the head and neck oriented for curving movement to the left.

Figure 6 is a bottom view of the preferred embodiment of the body of the decoy, with the buoyant base in place.

Figure 7 is a bottom view of the preferred embodiment of the invention, with the buoyant base removed to show the drive mechanism.

Figure 8 is a cross-sectional view of the preferred embodiment of the decoy of the invention with paddle wheel appendage assemblies, along line 8 - 8 of Figure 5, with the buoyant base removed.

Figure 9 is is a cross-sectional view of the preferred embodiment of the decoy of the invention with paddle wheel appendage assemblies, as in Figure 8, with the buoyant base in place.

Figure 10 is a side view of a paddle wheel assembly and a rotating wing assembly, in separated relation, illustrating the preferred structure and the preferred manner of attachment.

Figure 11 is a side view of an alternative embodiment of the paddle wheel assembly.

Figure 12 is a side view of a windmill wing assembly.

Detailed Description Of The Preferred Embodiment

With reference to the drawing figures, the preferred embodiment of the decoy of the invention generally includes a hollow decoy body shell 1, a buoyant base 2 a drive assembly 3, and a pair of appendage assemblies 4.

The apparatus of the invention utilizes a waterfowl decoy body formed as a shell with a hollow interior and a fully open bottom. Body 1 includes a top 5, opposing sides 6, a head end or forward end 7, and a tail end 8. The body shell has a lower edge 9 at the open bottom. A shaft aperture 10 is provided in each side 6 of the body, near the midpoint thereof, to receive a drive shaft. Buoyant base 2 is removably disposed at the bottom of the body shell, with its sides generally adjacent to lower edge 9 at the forward end and sides of the body. Base 2 extends through the majority of the length of the body from the forward end to the tail, but ends short of the tail to leave an opening into the interior of the body above the base at the tail end of the body. Base 2 is formed in a planar configuration, preferably of a relatively rigid, highly buoyant closed cell foam material.

In the preferred embodiment of the invention, drive assembly 3 generally includes a pair of battery powered electric motors 11, a battery holder 12 with switch 13, associated wiring 14,

and a mounting bracket 15 for the battery holder and switch. Each motor 11, which is preferably sealed for water resistance, includes an output shaft 16, which is caused to rotate when electrical power is applied to the motor. Each motor 11 preferably comprises a commercial direct current (DC) electric motor that will operate at approximately 250 rpm at 1.5 volts and at approximately 300 rpm at 3.0 volts. Switch 13 is preferably a variable resistance switch that is manually adjustable to supply between 1.5 volts and 3.0 volts to the motors for the purpose of adjusting the speed of the motors between about 250 rpm and about 500 rpm. Each motor 11 is secured to a respective side 6 of body 1 by rivets or other convenient means, with output shaft 16 extending through a shaft aperture 10 to the exterior of body 1. The output shafts function directly as drive shafts to which appendage assemblies 4 are connected. It is preferred that motors 11 be connected directly to the body shell, as shown in Figure 7, but mounting brackets, such as those shown in Figures 8 and 9, may be used, if desired. A gasket or other sealing means is provided around each output shaft 16 to prevent water from entering the interior of the motor through the opening in the motor housing through which the output shaft extends. Although the use of dual drive motors is preferred, the invention is not necessarily limited to that arrangement, and a single motor could be used to drive the two drive shafts, if desired.

Battery holder 12 and switch 13 are secured to mounting bracket 15, which is disposed in the interior of body 1 and connected to the body by rivets or other convenient means. Battery holder 12 includes positive and negative contacts connected to switch 13 and motors 11 by wiring 14. Mounting bracket 15 is preferably made from corrosion-resistant aluminum and is shaped to accommodate the components of the drive assembly attached to it and to position the battery holder and switch to facilitate access to them with the drive assembly installed in the body of the decoy.

In the preferred embodiment battery holder 12 is selected to receive two 1.5 volt D cell batteries, in series. As illustrated in Figure 7, mounting bracket 15 includes a pole aperture 17 with a pole retainer tab 18, to receive and frictionally retain one end of a mounting pole.

It should be understood that the while the disclosed motor rotational speed and operating voltage ranges are preferred, the invention is not limited to those ranges, and other ranges and even alternative drive means may be used within the scope of the invention. Battery holder 12 could, alternatively, be sized to hold a single 1.5 volt battery, and a simple on-off switch could be used in place of the variable speed switch. Switch 13 could be omitted entirely, so that motors 11 are activated by insertion of a battery or batteries into the battery holder and deactivated by removal of the battery. In a further alternative embodiment for controlling the operation of the motors, an interrupter relay may be associated with switch 13, or used in place thereof. The relay, if used, will intermittently interrupt the flow of electrical power from the battery to the motors, resulting in intermittent movement of the appendage assemblies instead of continuous movement.

The drive assembly of the decoy operates the appendage assemblies 4 to impart motion to the decoy. A variety of appendage assemblies may be connected, interchangeably and in combination, at the discretion of the user. ~~Preferred appendage assemblies include a paddle wheel assembly 19 and a rotating wing assembly 20, which may be used with the decoy floating on the surface of a body of water or mounted on a pole, and a windmill wing assembly 21, which may be used with the decoy mounted on a pole.~~

In the preferred embodiment each the paddle wheel assembly, illustrated in Figure 10, includes a hub 22 with a central hub aperture 23 to receive a drive shaft. Connection means,

preferably an adjustable set screw 24 is provided in hub 22 to selectively grip a drive shaft and removably connect the appendage assembly to the drive shaft. Two paddles 25 are connected in opposing relation to and extend outwardly from the hub in generally perpendicular relation to the axis of the hub aperture. It should be understood that while the two paddle configuration is preferred, three or more paddles, or a single paddle, could be used if desired. In the preferred embodiment the paddles are integrally formed as a single piece, which is connected to the hub. Each paddle is of sufficient length that a portion of the paddle will extend below the surface of the water when the appendage assemblies are connected to respective drive shafts and with the decoy floating on the water. When the drive means is activated the hubs are caused to rotate, driving the paddles through the water and propelling the decoy along the surface of the water. In addition to propelling the decoy in the water, the movement of the paddles through the water causes water to be splashed toward the rear of the decoy as long as the drive means is activated, providing a further attractive aspect to the decoy. In the preferred embodiment each paddle wheel assembly includes an extension shaft 26, extending outwardly in opposed coaxial alignment with the hub aperture, to facilitate attachment of rotating wing assemblies in combination with the paddle wheel assemblies.

Each rotating wing assembly, shown in Figure 10, includes a hub 27 with a hub aperture 28 and set screw 29 for connection of the hub to a drive shaft or to an extension shaft 26. A single wing 30 connected to its hub and extending outwardly therefrom with the longitudinal axis of the wing generally parallel to the axis of hub aperture 28. In the preferred embodiment each wing 30 comprises an elongate generally planar body formed with the general configuration and appearance of a waterfowl wing. Each wing is integrally formed with its associated hub 27, but it should be

understood that the wings and hubs may be separately formed and connected in any convenient manner. When a pair of the rotating wing appendage assemblies is connected to the drive shafts extending from the body of the decoy and the drive means is activated, the wings are caused to rotate around their longitudinal axes and mimic the appearance of a live bird flapping its wings. The flapping appearance may be enhanced by coloring one side of each wing a light color and the opposite side a dark color, if desired. The width of wing 30 is preferably less than twice the distance from the drive shafts extending from the body of the decoy to the surface of the water on which the decoy is placed to float, so that as wings 30 are caused to rotate by activation of the drive means the edges of the wings remain above the surface of the water. However, if desired, the width of the wings may be selected so that a portion of the wing will move through the water as the wing rotates and splash water from the surface as each edge of the wing leaves the water.

As noted above, the paddle wheel assemblies and the rotating wing assemblies may be used separately, as illustrated in Figures 5 and 3, respectively, or may be used in combination, as shown in Figure 4. When used separately, the hub of each appendage assembly is connected to a drive shaft 16, with the shaft extending into the hub aperture, and the set screw is tightened to retain the assembly in place. When used in combination, the paddle wheel assemblies are connected directly to drive shafts 16 and the rotating wing assemblies are connected to the paddle wheel assemblies, by connecting hubs 27 to shaft extensions 26. Upon activation of the drive means the paddles and wings are caused to rotate together in a combination of the movements described above, propelling the decoy along the surface of the water, splashing water around the decoy, and mimicking the appearance of flapping wings. When the decoy is prepared for use with the desired appendage assemblies attached, the drive means is activated and the decoy is placed

in the water. An anchor tab 31 is provided in the preferred embodiment so that the decoy can be anchored with an anchor line of desired length to restrain its range of movement and facilitate retrieval. Alternatively, the decoy may be mounted on a pole to elevate it above the surface of the water or position it on land, by inserting one end of the mounting pole through an aperture 32 in base 2 and into aligned aperture 17 in mounting bracket 15, where it is frictionally retained by pole tab retainer tab 18. If the decoy is to be mounted on a pole for use, windmill wing assemblies may be connected to drive shafts 16, if desired, to provide a alternative form of motion.

Like the other two appendage assemblies, each windmill wing assembly includes a hub 33, with a central aperture 34 and a set screw 35, and also includes wings 36. However, unlike the rotating wing assembly, the windmill wing assembly includes a pair of wings 36, connected in opposed relation to hub 33 with their longitudinal axes perpendicular to the axis of aperture 34. Since wings 36 extend outwardly from the axis rotation, they rotate in a windmill fashion.

When paddle wheel assemblies 19 are used, with or without rotating wing assemblies 20, to propel the decoy along the surface of a body of water, head and neck member 37, which is pivotally connected to the top of the body at its forward end, provides steering ability. When the head and neck member is aligned with the longitudinal axis of the body, as in Figure 3, the direction of travel is generally straight. However, rotation of the head and neck member to either side, as in Figures 4 and 5, shifts the weight balance to cause the decoy to follow a curved path.

The foregoing description of the preferred embodiments and certain alternative embodiments of the invention is intended to be illustrative and not limiting. The invention is susceptible to further alternative embodiments and variations in design and in use, all within the scope of the invention as disclosed and claimed.